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I. INTRODUCTION

This is an appeal from the decision of the Examiner, dated March 15, 2011, finally rejecting claims 1-17 (the "Office Action"). A Notice of Appeal is being filed concurrently with this Appeal Brief.

An oral hearing is requested.

Authorization is hereby given to charge \$540 for the filing of the present Appeal Brief, and any additional fees, to Deposit Account No. 19-1351, and credit any overpayment thereto.

II. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is BRONTO SKYLIFT OY AB, by way of an Assignment recorded in the U.S. Patent and Trademark Office beginning at Reel 017646, Frame 0432.

III. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

IV. STATUS OF CLAIMS

Claims 1-17 are on appeal.

Claims 1-17 are pending.

Claims 1-17 are finally rejected.

Claims 1, 5, 7, 16 and 17 are independent; and claims 2-4, 6, and 8-15 are dependent.

V. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

No amendments to the claims are made herein.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

The following summary of the claimed subject matter will discuss the independent claims of the present application and, where applicable, cite exemplary corresponding disclosure in the specification and figures, as published. These exemplary citations are not intended to limit the broad aspect of the invention to only that which is cited.

The subject invention is, *inter alia*, a method and equipment for fire fighting where a rescue boom is provided with an elongated piercing tool that can be pushed through a shell of a burning object such as a cabin of a vehicle. (Abstract, paragraph [0010]). A fire extinguishing medium can be conveyed through the piercing tool and to a nozzle, which thereafter expels the extinguishing medium in a manner that produces a flat, curtain-like shaped jet of extinguishing material. (Abstract). The flat, curtain-like shape is advantageous because it allows the jet of extinguishing medium to be accurately directed. (Paragraph [0010]). Also, the flat, curtain-like shape can form a "wall" to confine the burning object or protect passengers who are exiting the cabin. (*Id.*)

Independent claim 1 recites a method for fire-fighting, the method comprising piercing a shell (8, Fig. 1, paragraph [0031]) of a burning object by pushing at least one elongated piercing tool (7, Fig. 1, paragraph [0031]) arranged in a rescue boom (3, Fig. 1, paragraph [0031]) from the side of a first surface of the shell (8a, Fig. 1, paragraph [0031]) to the side of a second surface thereof (8b, Fig. 1, paragraph [0031]), feeding, along at least one longitudinal channel (14, Fig. 2, paragraphs [0031] and [0033]) in the piercing tool, a fire extinguishing medium (13, Fig. 1, paragraph [0031]) to a nozzle (12, Figs. 1 and 2, paragraph [0031]) provided in the piercing tool, spraying the fire extinguishing medium to the side of the second surface of the shell through a plurality of orifices (17, Fig. 2, paragraph [0033]) provided in the nozzle, and directing a plurality of single jets (20, Fig. 2, paragraph [0033]) expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape (13, Figs. 1 and 2, paragraph [0031]).

Independent claim 5 recites a rescue boom (3, Fig. 1, paragraph [0031]) comprising a boom (5a, 5b, Fig. 1, paragraph [0031]) provided with at least one movable boom part (5a, Fig. 1, paragraph [0031]) connected to a base (2, Fig. 1, paragraph [0031]), at least one piercing tool (7, Fig. 1, paragraph [0031]) arranged at a free end (leftmost end in Fig. 1) of the boom, the piercing tool being an elongated piece comprising at least one longitudinal channel (14, Fig. 2, paragraphs [0031] and [0033]), at least one actuator (34, paragraph [0040], Fig. 14) for moving the piercing tool in the longitudinal direction of the piercing tool with respect to an outermost end of the boom, at least one feed channel (11, Fig. 1, paragraph [0031]) for feeding a fire extinguishing medium (13, Fig. 1, paragraph [0031]) to the channel in the piercing tool, at least one nozzle (12, Figs. 1 and 2, paragraph [0031]), which is an elongated piece and which is connected to the channel in the piercing tool, the fire extinguishing medium being arranged to be fed through a plurality of orifices (17, Fig. 2, paragraph [0033]) provided in the nozzle, and wherein the longitudinal cross section (Figs. 3 and 4) of the nozzle, the orifices in the nozzle are arranged to pass via substantially the same imaginary plane (an imaginary vertical plane, if viewing Fig. 3) so that the fire extinguishing medium fed through the orifices forms a plurality of single jets (20, Fig. 2, paragraph [0033]) which intersect one another to form a single uniform jet having a flat curtain-like shape (13, Figs. 1 and 2, paragraph [0031]).

Independent claim 7 recites a nozzle (12, Figs. 1 and 2, paragraph [0031]) of a piercing tool (7, Fig. 1, paragraph [0031]) for spraying a fire extinguishing medium (13, Fig. 1, paragraph [0031]), the nozzle (12, Figs. 1 and 2, paragraph [0031]) being an elongated piece having a front end (the pointed end of the nozzle, paragraph [0033]) and a rear end (the end opposite the pointed end of the nozzle, paragraph [0033]) and the nozzle comprising fastening means (a means-plus-function limitation corresponding to the pin-like section that can be inserted into a recession 25 provided in the nozzle 12; Fig. 5, paragraph [0034]) at the rear end of the nozzle for fastening the nozzle to the piercing tool, at least one feed channel

(11, Fig. 1, paragraph [0031]) for feeding a fire extinguishing medium (13, Fig. 1, paragraph [0031]) to the nozzle; a plurality of orifices (17, Fig. 2, paragraph [0033]) extending from the feed channel to an outer surface of the nozzle, the orifices being directed obliquely forwards (Fig. 2) such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle (Fig. 2) and wherein the longitudinal cross section of the nozzle (Fig. 3), the orifices are arranged to pass via substantially the same imaginary plane (an imaginary vertical plane, if viewing Fig. 3) so that the fire extinguishing medium fed through the orifices forms a plurality of single jets (20, Fig. 2, paragraph [0033]) which intersect one another to form a single uniform jet having a flat curtain-like shape (13, Figs. 1 and 2, paragraph [0031]).

Independent claim 16 recites a method for fire-fighting, the method comprising piercing a shell (8, Fig. 1, paragraph [0031]) of a burning object by pushing a substantially conical nozzle (12, Figs. 1 and 2, paragraph [0031]) of at least one elongated piercing tool (7, Fig. 1, paragraph [0031]) arranged in a rescue boom (3, Fig. 1, paragraph [0031]) from the side of a first surface (8a, Fig. 1, paragraph [0031]) of the shell to the side of a second surface (8b, Fig. 1, paragraph [0031]) thereof, feeding, along at least one longitudinal channel (14, Fig. 2, paragraphs [0031] and [0033]) in the piercing tool, a fire extinguishing medium (13, Fig. 1, paragraph [0031]) to the substantially conical nozzle provided in the piercing tool; spraying the fire extinguishing medium to the side of the second surface of the shell through a plurality of orifices (17, Fig. 2, paragraph [0033]) provided in the substantially conical nozzle, the substantially conical nozzle having a solid front most portion (16, Fig. 2, paragraph [0033]) between a front most pair (Fig. 2) of the plurality of orifices; and directing a plurality of single jets (20, Fig. 2, paragraph [0033]) expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape (13, Figs. 1 and 2, paragraph [0031]).

Independent claim 17 recites a nozzle (12, Figs. 1 and 2, paragraph [0031]) of a piercing tool (7, Fig. 1, paragraph [0031]) for spraying a fire extinguishing medium (13, Fig. 1, paragraph [0031]) comprising: a substantially conical front end (the pointed end of the nozzle, paragraph [0033]) for piercing a shell (8, Fig. 1, paragraph [0031]) of a burning object; a fastening means (a means-plus-function limitation corresponding to the pin-like section that can be inserted into a recession 25 provided in the nozzle 12; Fig. 5, paragraph [0034]) at a rear end (the end opposite the pointed end of the nozzle, paragraph [0033]) of the nozzle for fastening the nozzle to the piercing tool; at least one feed channel (11, Fig. 1, paragraph [0031]) for feeding a fire extinguishing medium (13, Fig. 1, paragraph [0031]) to the nozzle, a plurality of orifices (17, Fig. 2, paragraph [0033]) extending from the feed channel through the substantially conical front end to an outer surface of the nozzle, the orifices being directed obliquely forwards (Fig. 2) such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice (18, Fig. 2, paragraph [0033]) and the middle axis (19, Fig. 2, paragraph [0033]) of the nozzle, wherein the longitudinal cross section of the nozzle (Figs. 3 and 4), the orifices are arranged to pass via substantially the same imaginary plane (a vertical plane, if viewing Fig. 3) so that the fire extinguishing medium fed through the orifices forms a plurality of single jets (20, Fig. 2, paragraph [0033]) which intersect one another to form a single uniform jet having a flat curtain-like shape (13, Figs. 1 and 2, paragraph [0031]); and a solid front most portion (16, Fig. 2, paragraph [0033]) of the conical front end between a front most pair of the plurality of orifices (Fig. 2).

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection is presented for review:

The Examiner rejected claims 1-10 and 14-17 under 35 U.S.C. §103(a) over Relyea et al. (U.S. Patent No. 5,301,756) in view of Glowienke (U.S. Patent No. 4,043,397).

VIII. ARGUMENT

In the March 15, 2011 Final Office Action, the Examiner finally rejected claims 1-10 and 14-17 under 35 U.S.C. §103(a) over Relyea et al. (U.S. Patent No. 5,301,756) in view of Glowienke (U.S. Patent No. 4,043,397). Claims 1, 5, 7, 16 and 17 are the only independent claims pending in this application. Appellant respectfully submits that the Examiner improperly applied the law relating to obviousness, and for the reasons discussed below, it is respectfully submitted that the rejection is in error and that all pending claims are in condition for allowance. Reversal of the rejection is respectfully requested.

A. The Examiner's §103(a) rejection is improper because Relyea and Glowienke each fail to disclose and would not have rendered obvious the claimed structure or process that produces a plurality of single jets ... [that] intersect one another to form a single uniform jet having a flat curtain-like shape

Independent claims 1, 5, 7, 16 and 17 each recites either a structure or process that produces "a plurality of single jets ... [that] intersect one another to form a single uniform jet having a flat curtain-like shape." Relyea and Glowienke fail to disclose, either alone or in combination, the above feature.

The benefits of the above configuration are discussed in the specification, for example, at paragraph [0010]:

An advantage of the invention is that the jet has a flat curtain-like shape, which enables the jet to be directed accurately. In addition, such a flat curtain-like jet can form a "wall" which enables an object to be extinguished to be confined. In aircraft fires, for example, a wall of a fire extinguishing medium can be formed between a seat of fire and the rest of a passenger cabin so that the fire can be prevented from expanding. Furthermore, the jet may serve as a wall to protect passengers exiting the passenger cabin.

The Examiner acknowledged that Relyea fails to disclose the above feature. (See, e.g., Final Rejection, page 2). The Examiner instead relies on Glowienke to allegedly remedy the deficiencies of Relyea. Yet, Glowienke also fails to disclose a structure or process that produces a plurality of single jets ... [that] intersect one another to form a single uniform jet having a flat curtain-like shape. The Examiner contends that Figure 6, element 19; and

Figure 1, element 34 of Glowienke, illustrate the above feature. (See, e.g., Final Rejection, page 2). Appellant respectfully disagrees.

Figure 6 of Glowienke illustrates a nozzle that is adapted to produce a diverging spray pattern and does not illustrate intersecting jets at all, as required by the claims of the present application. Figure 1 of Glowienke (reproduced below) illustrates the spray pattern, and shows that the single jets expelled from the Glowienke head 16 do not intersect one another in any manner.

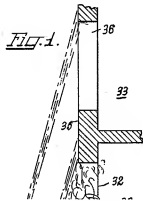
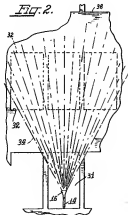


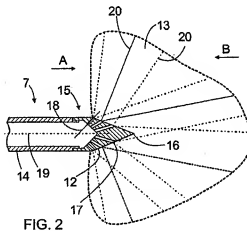
Figure 2 of Glowienke (reproduced below) further likewise illustrates the spray pattern of Glowienke does not include any single jets that intersect one another. Rather, as illustrated in Figure 2 of Glowienke, the spray pattern is made up of independent, separate, and diverging single jets.



Glowienke thus fails to disclose, and would not have rendered obvious, “a plurality of single jets ... [that] intersect one another to form a single uniform jet having a flat curtain-like shape,” as recited in independent claims 1, 5, 7, 16 and 17 of the present application. Because no combination of Relyea and/or Glowienke teaches each and every element of the claims, Appellant respectfully submits that the rejection of claims 1-10 and 14-17 under 35 U.S.C. §103(a) is improper and should be overturned.

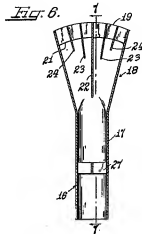
B. The Examiner’s §103(a) rejection is improper because Relyea and Glowienke each fail to disclose and would not have rendered obvious a plurality of orifices ... [wherein] the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle

Independent claims 7 and 17 recite “a plurality of orifices extending from the feed channel to an outer surface of the nozzle, the orifices being directed obliquely forwards such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle.” This feature is supported by, for example, Fig. 2 of the present application (reproduced below).



As shown in Fig. 2 above, the claimed orifice configuration allows the single uniform jet to be evenly distributed such that the intersecting single jets can efficiently form a wide, uniform jet.

The Examiner acknowledged that Relyea fails to disclose the above feature. (Final Rejection, page 4). The Examiner instead relied on Glowienke to allegedly remedy the deficiencies of Relyea. In particular, the Examiner contends that Fig. 6 of Glowienke discloses the above feature. Appellant respectfully disagrees.



As shown in Fig. 6 of Glowienke, (reproduced above), each of the orifices 21 in Glowienke is located at the front end of the nozzle. Glowienke fails to disclose any structure in the nozzle that is forward of the orifices. Thus, it is impossible for the orifices to be aligned at a different angle from the middle axis of the nozzle based on the distance between the orifices and the front end of the nozzle, because each of the orifices in Glowienke is located at the front-most end of the nozzle.

Therefore, Appellant respectfully submits that Relyea and Glowienke fail to disclose and would not have rendered obvious “a plurality of orifices extending from the feed channel to an outer surface of the nozzle, the orifices being directed obliquely forwards such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle,” as recited in independent claims 7 and 17. Because no combination of Relyea and/or Glowienke teaches each and every element of independent claims 7 and 17, Appellant respectfully submits that

the rejection of claims 7 and 17, and claims 8-13 depending from claim 7, under 35 U.S.C. §103(a), is improper and should be overturned.

C. **The Examiner's §103(a) rejection is improper because Relyea and Glowienke fail to disclose and would not have rendered obvious a substantially conical nozzle, the substantially conical nozzle having a solid front most portion between a front most pair of the plurality of orifices**

Independent claim 16 recites "...a substantially conical nozzle..., the substantially conical nozzle having a solid front most portion between a front most pair of the plurality of orifices..." Independent claim 17 recites similar features. Relyea and Glowienke fail to disclose and would not have rendered obvious the above feature.

The above feature allows the nozzle to pierce an object, such as an airplane that is on fire, and to thereafter expend flame retardant material in the form of a curtain-like shape. The solid front most portion of the nozzle pierces the object that is on fire, and the front-most nozzles expend flame retardant material.

The Examiner contends that Fig. 15 of Relyea discloses the above feature. (Final Rejection, page 6). Appellant respectfully disagrees.

Figs. 15 and 16 of Relyea (reproduced below), illustrates a piercing nozzle 192 having "a body portion 194, a tapered portion 196 of a piercing tip that has orifices 200 therein and a penetrating tip 198." Relyea, col. 10, lines 35-38. According to Relyea, "[t]he outer portion 198 of the piercing nozzle is a penetrating tip preferably made of chrome and is threadedly attached to the portion 196 by means of threads 197." Relyea, col. 10, lines 53-56. The penetrating tip of Relyea is threadedly attached to the tapered portion 196 which has orifices 200 therein, and is not attached between a front most pair of the plurality of orifices.

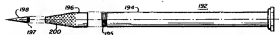


FIG. 15

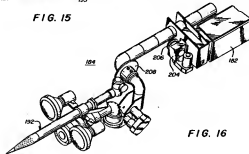


FIG. 16

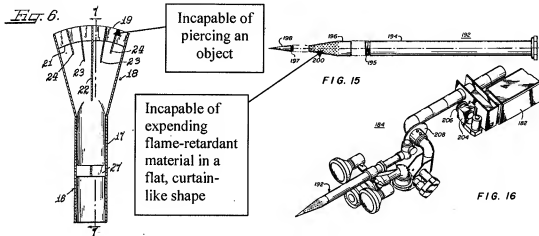
Relyea and Glowienke thus fail to disclose and would not have rendered obvious "...a substantially conical nozzle..., the substantially conical nozzle having a solid front most portion between a front most pair of the plurality of orifices," as recited in independent claim 16 and as similarly recited in independent claim 17. Because no combination of Relyea and/or Glowienke teaches each and every element of the claims, Appellant respectfully submits that the rejection of claims 16 and 17 under 35 U.S.C. §103(a) is improper and should be overturned.

D. Relyea and Glowienke would not have been obvious to combine

Appellants respectfully submit that Relyea and Glowienke would not have been obvious to combine, because doing so would render Relyea unsatisfactory for its intended purpose. MPEP §2143.01(V). Relyea discloses a boom system mounted to a vehicle that is capable of piercing a burning object. (Fig. 1, Abstract). The purpose of the Relyea boom system is to pierce a burning object and expel a flame retardant therein. (Abstract). However, the tool in Glowienke includes a structure, best shown in Fig. 6, that is incapable of piercing an object.

It would be impossible to combine the diverging structure of Glowienke (which allegedly expels a flame retardant in a flat, curtain-like shape) with the conical structure of Relyea (which is intended to pierce an object) without defeating the intended purpose of the Relyea - to pierce an object. The nozzle structures of Relyea and Glowienke are opposite one

another - Relyea discloses a conical structure converging at a point at the front most end, and Glowienke discloses a divergent structure that is wider at the front most end than at the rear end of the nozzle. If Glowienke were combined with Relyea, the resulting structure would be wider at the front most end, and thus incapable of piercing an object. The combination of Relyea and Glowienke would therefore render Relyea unsatisfactory for its intended purpose.



The Examiner is merely combining the individual features of Relyea and Glowienke based on impermissible hindsight reconstruction, using Appellants disclosure as a roadmap. (MPEP §2145(X)(A)). There is no structure in Relyea and Glowienke that, alone or combined, produces a boom system that can both (1) pierce a burning object; and (2) expel flame retardant in a flat, curtain-like shape. There is no teaching or suggestion in either Relyea or Glowienke that would have lead the skilled artisan to such a structure. The Examiner has failed to consider the resulting structure from the proposed combination, and has instead relied on the individual teachings of the cited references with a consistent eye on Appellant's claimed invention.

For at least these reasons, Appellant submits that the legal and factual bases for the §103(a) rejection are in error, and requests the Honorable Board to overturn the §103(a) rejection.

IX. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejection is in error and that claims 1-17 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of claims 1-17.

Respectfully submitted,

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APPENDIX A - CLAIMS APPENDIX

1. A method for fire-fighting, the method comprising:
piercing a shell of a burning object by pushing at least one elongated piercing tool arranged in a rescue boom from the side of a first surface of the shell to the side of a second surface thereof,
feeding, along at least one longitudinal channel in the piercing tool, a fire extinguishing medium to a nozzle provided in the piercing tool,
spraying the fire extinguishing medium to the side of the second surface of the shell through a plurality of orifices provided in the nozzle,
and directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape.
2. A method as claimed in claim 1, comprising
using said jet in order to confine a seat of fire.
3. A method as claimed in claim 1, comprising
turning the nozzle around the longitudinal axis of the piercing tool in order to turn the curtain-like jet.
4. A method as claimed in claim 1, comprising
turning the piercing tool around its longitudinal axis in order to turn the curtain-like jet.
5. A rescue boom comprising:
a boom provided with at least one movable boom part connected to a base,
at least one piercing tool arranged at a free end of the boom, the piercing tool being an elongated piece comprising at least one longitudinal channel,
at least one actuator for moving the piercing tool in the longitudinal direction of the piercing tool with respect to an outermost end of the boom,

at least one feed channel for feeding a fire extinguishing medium to the channel in the piercing tool,

at least one nozzle, which is an elongated piece and which is connected to the channel in the piercing tool, the fire extinguishing medium being arranged to be fed through a plurality of orifices provided in the nozzle,

and wherein the longitudinal cross section of the nozzle, the orifices in the nozzle are arranged to pass via substantially the same imaginary plane so that the fire extinguishing medium fed through the orifices forms a plurality of single jets which intersect one another to form a single uniform jet having a flat curtain-like shape.

6. A rescue boom as claimed in claim 5, wherein

means are provided in connection with the piercing tool for turning the curtain-like jet expelled from the nozzle with respect to the longitudinal axis of the piercing tool.

7. A nozzle of a piercing tool for spraying a fire extinguishing medium, the nozzle being an elongated piece having a front end and a rear end and the nozzle comprising:

fastening means at the rear end of the nozzle for fastening the nozzle to the piercing tool,

at least one feed channel for feeding a fire extinguishing medium to the nozzle,

a plurality of orifices extending from the feed channel to an outer surface of the nozzle, the orifices being directed obliquely forwards such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle,

and wherein the longitudinal cross section of the nozzle, the orifices are arranged to pass via substantially the same imaginary plane so that the fire extinguishing medium fed through the orifices forms a plurality of single jets which intersect one another to form a single uniform jet having a flat curtain-like shape.

8. A nozzle as claimed in claim 7, wherein

the cross section of the single orifices in the nozzle is dimensioned to be the larger the smaller the angle between the middle axis of the orifice and the middle axis of the nozzle so that the curtain-like jet is arranged to extend to a larger distance at the front of the nozzle than on the sides of the nozzle.

9. A nozzle as claimed in claim 7, wherein

the nozzle is a sleeve-like piece,

and the front end of the nozzle is provided with connecting means for fastening a separate tip piece.

10. A nozzle as claimed in claim 7, wherein

in the longitudinal cross section of the nozzle, the orifices are arranged successively in a first line of orifices and in a second line of orifices, and

the first line of orifices resides on a first side of the middle axis of the nozzle while the second line of orifices resides on a second side of the middle axis thereof so that the nozzle is arranged to form a uniform, curtain-like jet extending to the sides and to the front of the nozzle.

11. A nozzle as claimed in claim 7, wherein

in the longitudinal cross section of the nozzle, the orifices are arranged successively in a first line of orifices and in a second line of orifices,

and the first line of orifices resides on a first side of the middle axis of the nozzle while the second line of orifices resides on a second side of the middle axis thereof so that the nozzle is arranged to form a uniform, curtain-like jet extending to the sides and to the front of the nozzle,

and the outer surface of the nozzle is provided with at least one longitudinal groove at the first line of orifices and at least one longitudinal groove at the second line of orifices.

12. A nozzle as claimed in claim 7, wherein

in the longitudinal cross section of the nozzle, the orifices are arranged successively in a first line of orifices and in a second line of orifices,

and the first line of orifices resides on a first side of the middle axis of the nozzle while the second line of orifices resides on a second side of the middle axis thereof so that the nozzle is arranged to form a uniform, curtain-like jet extending to the sides and to the front of the nozzle,

and the outer surface of the nozzle is provided with at least one longitudinal groove at the first line of orifices and at least one longitudinal groove at the second line of orifices,

and two longitudinal grooves are provided successively both at the first line of orifices and at the second line of orifices,

and as seen from the front end of the nozzle, the first grooves extend to a section of the first orifices as seen from the front end of the nozzle only.

13. A nozzle as claimed in claim 7, wherein

in the longitudinal cross section of the nozzle, the orifices are arranged successively in a first line of orifices and in a second line of orifices,

and the first line of orifices resides on a first side of the middle axis of the nozzle while the second line of orifices resides on a second side of the middle axis thereof so that the nozzle is arranged to form a uniform, curtain-like jet extending to the sides and to the front of the nozzle,

and the outer surface of the nozzle is provided with at least one longitudinal groove at the first line of orifices and at least one longitudinal groove at the second line of orifices,

and the shape of the bottoms of the grooves in the outer surface of the nozzle is inwardly curved.

14. A method as claimed in claim 1, further comprising the step of extending a curtain-like flat jet to the front of the piercing tool.

15. A rescue boom as claimed in claim 5, wherein the orifices of the nozzle are directed obliquely forward.

16. A method for fire-fighting, the method comprising:
piercing a shell of a burning object by pushing a substantially conical nozzle of at least one elongated piercing tool arranged in a rescue boom from the side of a first surface of the shell to the side of a second surface thereof,

feeding, along at least one longitudinal channel in the piercing tool, a fire extinguishing medium to the substantially conical nozzle provided in the piercing tool,
spraying the fire extinguishing medium to the side of the second surface of the shell through a plurality of orifices provided in the substantially conical nozzle, the substantially conical nozzle having a solid front most portion between a front most pair of the plurality of orifices,

and directing a plurality of single jets expelled from the orifices so that they intersect one another to form a single uniform jet having a flat curtain-like shape.

17. A nozzle of a piercing tool for spraying a fire extinguishing medium comprising:

a substantially conical front end for piercing a shell of a burning object;
a fastening means at a rear end of the nozzle for fastening the nozzle to the piercing tool,

at least one feed channel for feeding a fire extinguishing medium to the nozzle,
a plurality of orifices extending from the feed channel through the substantially conical front end to an outer surface of the nozzle, the orifices being directed obliquely forwards such that the farther away from the front end of the nozzle a single orifice resides, the larger an acute angle between the middle axis of the orifice and the middle axis of the nozzle,

wherein the longitudinal cross section of the nozzle, the orifices are arranged to pass via substantially the same imaginary plane so that the fire extinguishing medium fed through the orifices forms a plurality of single jets which intersect one another to form a single uniform jet having a flat curtain-like shape; and

a solid front most portion of the conical front end between a front most pair of the plurality of orifices.

APPENDIX B - EVIDENCE APPENDIX

NONE

APPENDIX C - RELATED PROCEEDINGS APPENDIX

NONE